

THE CLAIMS

What is claimed is:

- 5 1. A flexible paper-plastic laminate sheeting comprising at least one paper sheet, a reinforcing film of a synthetic oriented polymer that has at least one surface treated to increase its dynes and make it receptive to adhesives, wherein the film is laminated to at least one of the paper sheets by a water-based adhesive that contacts the treated surface of the film and has
10 its water absorbed by the paper sheet to effect lamination thereof.
2. The laminate sheeting of claim 1 wherein the film has undergone molecular orientation to increase its strength prior to lamination, and the surface of the film is treated by ionization using corona discharge.
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3. The laminate sheeting of claim 1 wherein the film is biaxially oriented.
4. The laminate sheeting of claim 1 wherein the film is
20 polypropylene, polyethylene, or polyester.
5. The laminate sheeting of claim 1 wherein the water-based adhesive is a polyacrylate or vinyl acetate ethylene copolymer.
- 25 6. The laminate sheeting of claim 1 wherein the paper facing sheet is formed of Kraft paper.
7. A flexible paper-plastic laminate sheeting comprising first and second paper sheets, a reinforcing film of a synthetic oriented polymer that

has first and second surfaces treated to increase its dynes and make it receptive to adhesives, wherein the film is laminated to both paper sheets by a water-based adhesive that contacts each treated surface of the film and has its water absorbed by the respective first and second paper sheets to effect
5 lamination thereof.

8. The laminate sheeting of claim 7 wherein the film has undergone molecular orientation to increase its strength prior to lamination, and the surface of the film is treated by ionization using corona discharge.
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9. The laminate sheeting of claim 7 wherein the film is biaxially oriented.

10. The laminate sheeting of claim 7 wherein the film is
15 polypropylene, polyethylene, or polyester.

11. The laminate sheeting of claim 7 wherein the water-based adhesive is a polyacrylate or vinyl acetate ethylene copolymer.

20 12. The laminate sheeting of claim 7 wherein the paper facing sheet is formed of Kraft paper.

13. A method of making a flexible paper-plastic laminate sheeting comprising: providing a supply of a first paper sheet having first and second
25 surfaces; providing a supply of a reinforcing film of a synthetic oriented polymer material having first and second surfaces; treating the first surface of the film to increase its dynes and its affinity to adhesives; applying a water-based adhesive to the treated first surface of the film; and cold-laminating the adhesive bearing first film surface to the first surface of the

paper sheet the film such that the water of the adhesive is absorbed by the paper sheet to effect lamination thereof and form a product that has a paper surface and resistance against tearing and bursting.

5 14. The method of claim 13, which further comprises: providing a supply of a second paper sheet having first and second surfaces; treating the second surface of the film to increase its dynes and its affinity to adhesives; applying a water-based adhesive to the treated second surface of the film; and cold-laminating the adhesive bearing second film surface to the first
10 surface of the second paper sheet such that the water of the adhesive is absorbed by the paper sheet to effect lamination thereof and form a non-curling, three-ply laminate sheeting product that has outer printable paper surfaces and resistance against tearing and bursting.

15 15. The method of claim 14, wherein the film has undergone molecular orientation to increase its strength prior to lamination, and the treated first and second surfaces are achieved by ionization using corona discharge.

20 16. The method of claim 15, wherein the film is biaxially oriented.

 17. The method of claim 15, wherein the orientation of the film is unchanged after cold laminating.

25 18. The method of claim 13, wherein the film is polypropylene, polyethylene or polyester.

19. The method of claim 13, wherein the water-based adhesive comprises a polyacrylate or vinyl acetate ethylene copolymer and the paper facing sheet is formed of Kraft paper.

5 20. The method of claim 14, wherein each water-based adhesive comprises a polyacrylate or vinyl acetate ethylene copolymer and the paper facing sheet is formed of Kraft paper.

21. The method of claim 13, wherein the laminate sheeting is
10 produced at a speed of 150 to 500 feet per minute or greater.

22. The method of claim 13, wherein the laminate sheeting is produced at a higher speed than a paper-plastic laminate sheeting made using a hot melt adhesive.

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23. The method of claim 13, wherein adverse health and environmental effects are avoided since no organic solvents are present in the adhesive or are used during cold laminating.

20 24. The method of claim 13, wherein the laminate sheeting is made without producing high and low strength areas of the film in order to avoid curling or wrinkling.

25 25. The method of claim 13, wherein the laminate sheeting is made without exposing the oriented polymer film to elevated temperatures that would cause the film to relax and lose orientation or strength.

26. A flexible paper-plastic laminate sheeting comprising, in combination, at least one paper facing sheet laminated to at least one

reinforcing film of a synthetic oriented polymer using a water-based adhesive that does not contain volatile organic solvents and that does not require the addition of curing agents or catalysts to promote curing of the adhesive, and the surface of the film that is laminated to the paper facing sheet is treated by
5 ionization to enhance its affinity for the water-based adhesive, whereby products made from the sheeting have a printable paper exterior.

27. The laminate sheeting of claim 26 wherein the film is biaxially oriented.

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28. The laminate sheeting of claim 27 wherein the water-based adhesive is a polyacrylate or vinyl acetate ethylene copolymer.